Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

1. (Currently Amended) A time-division-multiplexed light signal channel extraction method that separates ~~the~~ time-division-multiplexed signals into as many as N channels and extracts ~~the~~ channel numbers in order to provide ~~the~~ demultiplexed signals to ~~the~~ output ports of which port numbers match with the channel numbers, comprising:

a demultiplexing step of demultiplexing the multiplexed signals into N channels and providing the demultiplexed signals to as many as N separate ports;

an extraction step of extracting ~~the~~ a channel number of at least one channel in the N channels corresponding to said N separate ports;

a switching step of switching each of the N channels to ~~the~~ an output ~~ports~~ port of which port ~~numbers~~ number uniquely ~~match~~ matches with the ~~numbers~~ channel number of one of the N channels based on ~~the~~ relationship between the number of the at least one channel identified in the extraction step and the output port number ~~corresponding~~ equal to said channel number of the one channel ~~number~~; and

an output step of providing the signals of said switched N channels to the output ports of which output port numbers match with the channel numbers.

2. (Currently Amended) A time-division-multiplexed light signal channel extraction method that separates ~~the~~ time-division-multiplexed signals into as many as N channels and extracts ~~the~~ channel numbers in order to provide ~~the~~ demultiplexed signals to ~~the~~ output ports of which port numbers match with ~~the~~ channel numbers, comprising:

a demultiplexing step of demultiplexing the multiplexed signals into N channels and providing the demultiplexed signals to as many as N separate ports;

an extraction step of extracting ~~the~~ a channel number of at least one channel in the N channels corresponding to said N separate ports;

a control step of controlling ~~the signals of~~ said N channels provided to the separate ports so that the number of each of the N ~~channel numbers~~ channels uniquely ~~match~~ matches with the output port numbers based on ~~the~~ relationship between the number of the one channel identified in the extraction step and ~~the~~ an output port number ~~corresponding~~ equal to said channel number of the one channel ~~number~~; and

an output step of providing the signals of said ~~switched~~ N channels to the output ports of which output port numbers match with the channel numbers.

3. (Currently Amended) A time-division-multiplexed light signal channel extraction method that separates ~~the~~ time-division-multiplexed signals into as many as N channels and ~~extracts the channel numbers in order to provide~~ provides the demultiplexed signals to ~~the~~ output ports of which port numbers match with ~~the~~ channel numbers, comprising:

a demultiplexing step of demultiplexing ~~the~~ irregular-intervals time-division-multiplexed light signals, of which channel intervals on the time axis are not regular, into N channels and providing ~~the~~ demultiplexed signals to as many as N separate ports ~~of the same intervals as those of~~, wherein each of the N separate ports is set in delay time corresponding to each of the ~~channels~~ channel intervals, and wherein, when ~~the~~ numbers of the N channels match with ~~the~~ numbers of the output ports, the signals are provided to all the N separate ports;

a control step of monitoring ~~the~~ signal output to the output ports and controlling the signals of said N channels provided to the separate ports so that all the N separate ports ~~receive~~ respectively output the signal output; and

an output step of providing the signals of said ~~switched~~ N channels to the output ports of which output port numbers match with the channel numbers.

4. (Currently Amended) The method as set forth in claim 3, wherein~~,~~ ~~when~~ pulse width of said irregular-intervals time-division-multiplexed light signals is τ_{send}sec, where ~~the~~ i-th channel is adjacent to ~~the~~ (i+1)-th channel, ~~the~~ N-th channel is adjacent to the first channel, ~~the~~ a bit rate is Nf_o(bit/s), ~~the pulse width is τ_{send}sec,~~ the channel intervals meet ~~the~~ relations:

$$\Delta t_i\left(i=1,\ 2,...,N\right)\neq\Delta t_j\left(j=1,\ 2,...,N\right)(j\neq i)$$

where $\tau_{send} \leq 1/(Nf_o)$ and $\Delta t_1+\Delta t_2+...+\Delta t_{N-1}+\Delta t_N = 1/f_o$~~, said irregular-intervals time-division-multiplexed light signals meet the relation $\Delta t_i(i=1, 2,..., N) \neq \Delta t_j(j=1, 2,..., N)(j\neq i)$~~.

5 . (Currently Amended) The method as set forth in claim [4] 3, wherein pulse width of said irregular-intervals time-division-multiplexed light signals is τ_{send}sec, where i-th channel is adjacent to (i+1)-th channel, N-th channel is adjacent to the first channel, bit rate is Nf_o (bit/s), the channel intervals meet the relations:

Δt_i (i=1, 2,..., N) $\neq \Delta t_j$ (j=i+1 or j=i-1);

$\Delta t_{N+1}=\Delta t_1$; and

$\Delta t_{-1}=\Delta t_N$

wherein $\tau_{send} \leq 1/(Nf_o)$ and $\Delta t_1+\Delta t_2+...+\Delta t_{N-1}+\Delta t_N = 1/f_o$.

6. (Currently Amended) A time-division-multiplexed light signal channel extraction apparatus that separates ~~the~~ time-division-multiplexed signals into as many as N channels and extracts ~~the~~ channel numbers in order to provide ~~the~~ demultiplexed signals to ~~the~~ output ports of which port numbers match with the channel numbers, comprising:

an optical time-division-demultiplexing means for demultiplexing the multiplexed signals into N channels and providing ~~the~~ demultiplexed signals to as many as N separate ports;

a channel extraction means that is connected to ~~the~~ N separate ports and extracts ~~the~~ a channel number of at least one channel in the N channels corresponding to said N separate ports;

a channel switching means for switching each of the N channels to the output ports of which port numbers uniquely match with ~~the~~ numbers of each of the N channels based on ~~the~~ relationship between the channel number of the one channel identified by the channel extraction means and the output port number ~~corresponding~~ equal to the channel number of said one channel ~~number~~; and

an output means that has as many as N output ports and provides ~~the~~ signals of said switched N channels to the output ports of which output port numbers match with the channel numbers.

7. (Currently Amended) A time-division-multiplexed light signal channel extraction apparatus that separates ~~the~~ time-division-multiplexed signals into as many as N channels and extracts ~~the~~ channel numbers in order to provide ~~the~~ demultiplexed signals to ~~the~~ output ports of which port numbers match with the channel numbers, comprising:

an optical time-division-demultiplexing means for demultiplexing the multiplexed signals into N channels and providing the demultiplexed signals to as many as N separate ports;

a channel extraction means that is connected to the N separate ports and extracts ~~the~~ channel number of at least one channel in the N channels corresponding to said N separate ports;

a channel control means for controlling ~~the signals of~~ said N channels provided to the separate ports so that channel numbers of each of the N channels ~~numbers~~ uniquely match with ~~the~~ output port numbers based on ~~the~~ relationship between the number of the one channel identified by the channel extraction means and ~~the~~ an output port number ~~corresponding~~ equal to said number of the one channel ~~number~~; and

an output means that has as many as N output ports and provides the signals of said ~~switched~~ N channels to the output ports of which output port numbers match with the channel numbers.

8. (Currently Amended) A time-division-multiplexed light signal channel extraction apparatus that separates ~~the~~ time-division-multiplexed signals into as many as N channels and ~~extracts the channel numbers in order to provide~~ provides ~~the~~ demultiplexed signals to ~~the~~ output ports of which port numbers match with ~~the~~ channel numbers, comprising:

a optical time-division-demultiplexing means for demultiplexing ~~the~~ irregular-intervals time-division-multiplexed light signals, of which channel intervals on the time axis are not regular, into N channels and providing ~~the~~ demultiplexed signals to as many as N separate ports ~~of the same intervals as those of~~, wherein each of the N separate ports is set in delay time corresponding to each of the ~~channels~~ channel intervals, and wherein, when the channel numbers of the N channels match with ~~the~~ numbers of the output ports, the signals are provided to all the N separate ports;

a channel control means for monitoring ~~the~~ signal output to the output ports and controlling the signals of said N channels provided to the separate ports so that all the N separate ports ~~receive~~ respectively output the signal output; and

an output means that has as many as N output ports and provides the signals of said ~~switched~~ N channels to the output ports of which output port numbers match with the channel numbers.

9. (Currently Amended) The apparatus as set forth in any one of claims 6-8; wherein said optical time-division-demultiplexing means comprising:

a means for coupling the multiplexed signals and chirp light pulses; and

a cross-correlating means for providing a cross-correlation signal when the multiplexed signal overlaps the chirp light pulse and converting ~~the~~ sequence of the N channels for multiplexed signals on the time axis into ~~the~~ unique sequence of channels

on the wavelength axis to provide the demultiplexed signals to the N separate channels.

10. (Currently Amended) The apparatus as set forth in claim 9, wherein said cross-correlating means provides a cross-correlation signal by using one of ~~the~~ four wave mixing using a semiconductor amplifier, cross phase modulation using optical fiber, cross absorption modulation using an electric field absorption type optical amplifier and quasi-phase matching in secondary nonlinear optical material.

11. (Currently Amended) The apparatus as set forth in any one of claims 6-8; wherein said optical time-division-demultiplexing means ~~comprising~~ comprises:

a coupling means that provides different delays to at least either the multiplexed signals separated into N channels or ~~the~~ gate light pulses separated into N channels so that the signals and pulses overlap at different timing in ~~the~~ individual channels; and

as many as N cross-correlating means for providing a cross-correlation signal when the multiplexed signal overlaps the chirp light pulse.

12. (Currently Amended) The apparatus as set forth in claim 11, wherein said cross-correlating means provides ~~a~~ the cross-correlation signal by using one of ~~the~~ four wave mixing using a semiconductor amplifier, cross phase modulation using optical fiber, cross absorption modulation using an electric field absorption type optical amplifier and quasi-phase matching in secondary nonlinear optical material.

13. (Currently Amended) The apparatus as set forth in claim 8, wherein, ~~when~~ pulse width of said irregular-intervals time-division-multiplexed light signals is τ_{send}sec, where the i-th channel is adjacent to the (i+1)-th channel, the N-th channel is adjacent to the first channel, ~~the~~ a bit rate is Nf_0(bit/s), ~~the pulse width is τ_{send}sec,~~ the channel intervals meet the relations:

$$\Delta t_i\left(i=1,\ 2,...,N\right) \neq \Delta t_j\left(j=1,\ 2,...,N\right)\left(j \neq i\right)$$

where $\tau_{send} \leq 1/(Nf_o)$ and $\Delta t_1+\Delta t_2+...+\Delta t_{N-1}+\Delta t_N = 1/f_o$~~, said irregular-intervals time-division-multiplexed light signals meet the relation $\Delta t_i(i=1, 2,..., N) \neq \Delta t_j(j=1, 2,..., N)(j \neq i)$~~.

14. (Currently Amended) The apparatus as set forth in claim ~~13~~ 8, wherein pulse width of said irregular-intervals time-division-multiplexed light signals is τ_{send}sec, where i-th channel is adjacent to (i+1)-th channel, N-th channel is adjacent to the first channel, bit rate is Nf_o(bits), the channel intervals meet the relations:

$\Delta t_i(i=1, 2,..., N) \neq \Delta t_j(j=i+1$ or $j=i-1)$;

$\Delta t_{N+1}=\Delta t_1$; and

$\Delta t_{-1}=\Delta t_N$

where $\tau_{send} \leq 1/(Nf_o)$ and $\Delta t_1+\Delta t_2+...+\Delta t_{N-1}+\Delta t_N = 1/f_o$.